

Bogenlänge - Bogenmaß - Gradmaß / Lösungen

M10

Aufgabe 1

a) $\frac{60^\circ}{360^\circ} \cdot 2\pi = \frac{1}{3}\pi = \frac{\pi}{3}$

b) $\frac{240^\circ}{360^\circ} \cdot 2\pi = \frac{4}{3}\pi = \frac{4\pi}{3} = 1\frac{1}{3}\pi$

c) $\frac{30^\circ}{360^\circ} \cdot 2\pi = \frac{1}{6}\pi = \frac{\pi}{6}$

d) $\frac{120^\circ}{360^\circ} \cdot 2\pi = \frac{2}{3}\pi = \frac{2\pi}{3}$

e) $\frac{18^\circ}{360^\circ} \cdot 2\pi = \frac{1}{10}\pi = \frac{\pi}{10}$

f) $\frac{320^\circ}{360^\circ} \cdot 2\pi = \frac{16}{9}\pi = \frac{16\pi}{9} = 1\frac{7}{9}\pi$

g) $\frac{2^\circ}{360^\circ} \cdot 2\pi = \frac{1}{90}\pi = \frac{\pi}{90}$

h) $\frac{300^\circ}{360^\circ} \cdot 2\pi = \frac{15}{9}\pi = \frac{5\pi}{3} = 1\frac{2}{3}\pi$

Aufgabe 2

a) $\frac{\frac{4}{3}\pi}{2\pi} \cdot 360^\circ = \frac{2}{3} \cdot 360^\circ = 240^\circ$

b) $\frac{\frac{2}{2}\pi}{2\pi} \cdot 360^\circ = \frac{1}{9} \cdot 360^\circ = 40^\circ$

c) $\frac{\frac{1}{5}\pi}{2\pi} \cdot 360^\circ = \frac{1}{10} \cdot 360^\circ = 36^\circ$

d) $\frac{\frac{1}{2}\pi}{2\pi} \cdot 360^\circ = \frac{5}{8} \cdot 360^\circ = 225^\circ$

e) $\frac{\frac{10}{9}\pi}{2\pi} \cdot 360^\circ = \frac{5}{9} \cdot 360^\circ = 200^\circ$

f) $\frac{\frac{1}{6}\pi}{2\pi} \cdot 360^\circ = \frac{11}{12} \cdot 360^\circ = 330^\circ$

g) $\frac{0,4\pi}{2\pi} \cdot 360^\circ = 0,2 \cdot 360^\circ = 72^\circ$

h) $\frac{1,75\pi}{2\pi} \cdot 360^\circ = 0,875 \cdot 360^\circ = 315^\circ$

Aufgabe 3

a) $b = \frac{\alpha}{360^\circ} \cdot 2\pi r = \frac{90^\circ}{360^\circ} \cdot 2\pi \cdot 5 \text{ cm} \approx 7,9 \text{ cm}$

b) $b = \frac{120^\circ}{360^\circ} \cdot 2\pi \cdot 5 \text{ cm} \approx 10,5 \text{ cm}$

c) $b = \frac{30^\circ}{360^\circ} \cdot 2\pi \cdot 10 \text{ cm} \approx 5,2 \text{ cm}$

d) $b = \frac{150^\circ}{360^\circ} \cdot 2\pi \cdot 0,8 \text{ cm} \approx 2,1 \text{ cm}$

Aufgabe 4

a) $\alpha_G = \frac{b}{2\pi r} \cdot 360^\circ = \frac{4 \text{ cm}}{2\pi \cdot 5 \text{ cm}} \cdot 360^\circ \approx 45,8^\circ$ $\alpha_B = \frac{b}{2\pi r} \cdot 2\pi = \frac{b}{r} = 0,8$

b) $\alpha_G = \frac{b}{2\pi r} \cdot 360^\circ = \frac{1 \text{ cm}}{2\pi \cdot 5 \text{ cm}} \cdot 360^\circ \approx 11,5^\circ$ $\alpha_B = \frac{b}{2\pi r} \cdot 2\pi = \frac{b}{r} = 0,2$

c) $\alpha_G = \frac{b}{2\pi r} \cdot 360^\circ = \frac{9 \text{ cm}}{2\pi \cdot 10 \text{ cm}} \cdot 360^\circ \approx 51,6^\circ$ $\alpha_B = \frac{b}{2\pi r} \cdot 2\pi = \frac{b}{r} = 0,9$

d) $\alpha_G = \frac{b}{2\pi r} \cdot 360^\circ = \frac{0,1 \text{ cm}}{2\pi \cdot 0,8 \text{ cm}} \cdot 360^\circ \approx 7,2^\circ$ $\alpha_B = \frac{b}{2\pi r} \cdot 2\pi = \frac{b}{r} = 0,125 \approx 0,1$

Aufgabe 5

a) $A = \frac{\alpha}{360^\circ} \cdot \pi r^2 = \frac{90^\circ}{360^\circ} \cdot \pi \cdot (5 \text{ cm})^2 \approx 19,6 \text{ cm}^2$

b) $A = \frac{\alpha}{2\pi} \cdot \pi r^2 = \frac{\pi}{2\pi} \cdot \pi \cdot (5 \text{ cm})^2 \approx 6,5 \text{ cm}^2$

c) $A = \frac{\alpha}{2\pi} \cdot \pi r^2 = \frac{\frac{2}{3}\pi}{2\pi} \cdot \pi \cdot (8 \text{ cm})^2 \approx 67,0 \text{ cm}^2$

d) $A = \frac{\alpha}{360^\circ} \cdot \pi r^2 = \frac{120^\circ}{360^\circ} \cdot \pi \cdot (0,6 \text{ cm})^2 \approx 0,4 \text{ cm}^2$